Synopsis of Original Research Paper

Cellulose Derivatives with Permanently Colorful Reflection Characteristics

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This report describes the syntheses and reflection properties of cellulosic derivatives with permanently colorful reflection characteristics. Cellulosic derivatives tethering appropriate side chains are well known to form cholesteric liquid crystals with visible reflection features in line with Bragg's law. When hydroxypropyl cellulose (HPC) was chemically modified by various aliphatic groups in the side chains, the reflection peak monotonously shifted to longer wavelength upon stepwise heating process. This happened from the increase in CLC helical pitch. By using crosslinkable HPC derivatives tethering acryloyl side chains, we succeeded in the permanent preservation of periodic helical CLC structure with visible reflection features by photocrosslinking reaction between the acryloyl groups, resulting in facile fabrication of full-color imaging films. Such films of cellulose derivatives could be also applied to intriguing sensors with respect to mechanical stress and surface roughness. This report provides promising clues to fabricate the next-generation photonic devices from an environment- and human-benign biomass of cellulose.